



## **Donald Thorn Farley, Jr.**

October 26, 1933 – May 13, 2018

Donald Thorn Farley, Jr. was born in New York City on October 26, 1933. Don entered the College of Engineering at Cornell University under a full athletic scholarship, running for the track and cross-country teams. After receiving his B.Eng. Phys. and Ph.D. degrees from Cornell, Don spent a year at Cambridge University as a NATO Postdoctoral Fellow, a year as Docent at Chalmers University in Sweden, and then six years in Peru at the Jicamarca Radio Observatory, three of them as director, before returning to the United States and joining the Cornell faculty as a full professor in 1967. He returned to Sweden in 1985 for a year as the Tage Erlander Visiting Professor at the Uppsala Ionospheric Observatory and was, in 1995, the Von Humboldt Senior Scientist at the Max-Planck Institute fur Aeronomie in Katlenberg-Lindau. Between 1979 and 2003, he was the Principal Investigator for the NSF award supporting research at Jicamarca.

Throughout his career, Don was a pioneer in radio and space physics. His Ph.D. work considered how electrostatic fields in the ionosphere vary along geomagnetic field lines. His best-known early-career work, however, focused on the development of incoherent scatter theory, the theory of radio wave scattering from thermal density fluctuations in ionospheric plasmas. Incoherent scatter would become the most incisive tool available for studying ionospheric plasmas from the ground. Don developed not only the theory but also the practical methods for ionospheric research with incoherent scatter at emerging facilities such as the Arecibo Radio Telescope in Puerto Rico and at Jicamarca especially where the effects of the earth's magnetic field require special attention. Working at Jicamarca, Don also discovered the class of plasma waves and instabilities known now to exist also at middle and high latitudes and that now bear his name. Don also introduced important new methods to radio science including radar interferometry which plays a key role not only in ionospheric research but also in radar studies of the mesosphere, stratosphere, and troposphere (MST).

Don's work resulted in two U.S. Department of Commerce Distinguished Authorship Awards and a Gold Medal. In 1993, he became a Fellow of the Institute of Electrical and Electronics Engineers. He was awarded the Appleton Prize at the International Scientific Radio Union

General Assembly in 1996 (the first American to win the prize in 18 years). He received the Gold Medal for Geophysics from the Royal Astronomical Society in 1997. He was awarded the Hannes Alfvén Medal by the European Geophysical Union in 2010. He was the recipient of the CEDAR Distinguished Lecture in 2012. It is estimated that about 80 percent of all ionospheric radio scientists in the United States who practice incoherent scatter were trained by Farley, or by his students.

As an educator, he was commended for teaching with skill, wit, and insight and for his particular talent for finding simplicity in the face of complexity. In 1996, he won a College of Engineering Award for Excellence in Teaching.

Don is survived by his wife Dorothy Pasternack of Ithaca. He is also survived by his three children: Claire Farley (Jim Hisle) of Phoenix, AZ; Anne Farley Cremer (Jim Cremer) of Iowa City, IA; and Peter Farley (Kathy Johnson Farley) of Ithaca; as well as four grandchildren: Christopher Towle Farley Wright, Jennie Lynn Wright, Laura Farley Cremer, and Paul Farley Cremer.

*Written by David Hysell and Charles Seyler*